MODEL TBATC-2000
TCP/IP TO RS-232/422/485 CONVERTER
User's Guide

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1. Getting to Know your TBATC-2000

1.1 Introduction

The TBATC-2000 is a RS232/RS485 to TCP/IP converter integrated with a robust system and network management features designed for industrial equipment to be accessed and controlled via Intranet or Internet. By integrating RTOS (Real Time Operating System) and complete TCP/IP protocol stack capability, TBATC's TBATC-2000 provides not only a robust and high performance system to make your device connecting to Network, but also ease installation and Internet access. The TBATC-2000 Web Configurator is a breeze to operate and totally independent of the operating system platform you use.

1.2 Main features

The following are the main features of TBATC-2000

TCP/UDP server/client support

The TBATC-2000 support four types of connection: TCP server, UDP server, TCP client and UDP client, user can select one of types to meet application requirement.

DHCP Client

DHCP (Dynamic Host Configuration Protocol) client obtains the TCP/IP configuration at start-up from a centralized DHCP server, which means it can get IP address, an IP default gateway and DNS server.

PPP Over Ethernet

PPPoE is a protocol for connecting remote hosts to the Internet over DSL connection by simulating dial-up connection.

Dynamic DNS

With dynamic DNS support, you can have a static hostname alias for a dynamic IP address, allowing the host to be more easily accessible from various locations on the Internet.

Auto-negotiating 10/100Mbps Ethernet

The Ethernet interface automatically detects if it is on a 10 or a 100 Mbps Ethernet.

Full Network Management via Web

This feature allows you to access or manage device through IE or Netscape on

any platform. The firmware also can be upgraded via Web browser.

Backup and Restore configuration

This feature allows you to backup system configuration to a file and restores it, for the security issue, the file which backup from system is an encryption format.

IO Controller

The TBATC-2000 supports 3 DI/3 DO totally; 3 DI with any combination rule can trigger each DO. By providing a smart and easily setup way via Web, user doesn't need to have any programmer background.

Alarm Generation

With SMTP client support, you can set system to trigger alarm message via e-mail or SMS (Short Message System) to your mobile phone.

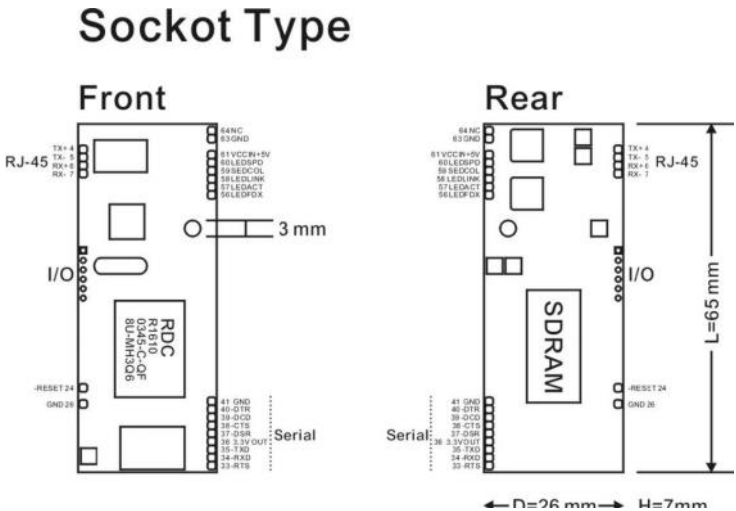
1.3 Applications for TBATC-2000

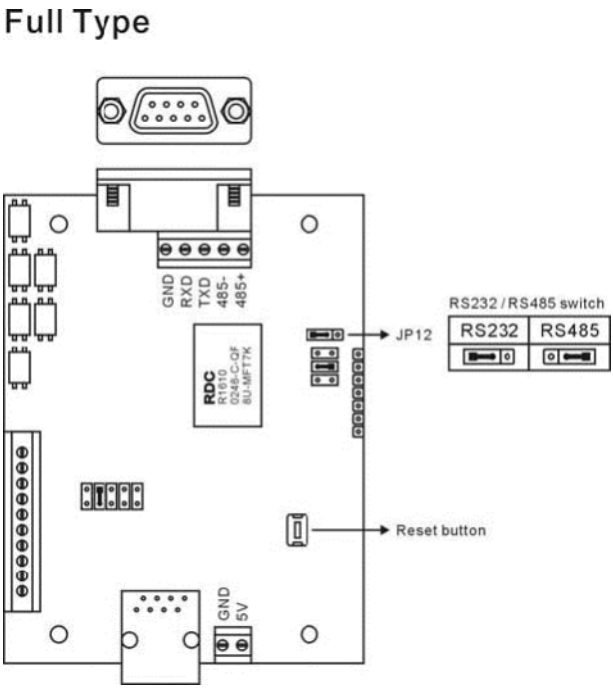
Figure 1 Standalone TBATC-2000's application through Internet

Figure 2 Socket-Type TBATC-2000's application through Internet

2. Hardware Installation & Initial Setup

2.1 Hardware Installation





2.2 LED status

LED	Color(s)	Activity	Desc.
Power	Red	OFF	Power OFF
		Red	Power On
Ethernet	Link Green	Off	No Ethernet Link
		Green On	Ethernet Link established
	Speed Green	Off	10 Mbps
		Green	100 Mbps
ACT	Link Yellow	Off	No TCP/IP session link
		Green On	TCP/IP session link established
		Green Blinking	Data Sending/Receiving between Serial and Ethernet

2.3 Initial Setup

Use this section to set up your computer to assign it a static IP address in the 192.168.168.1 to 192.168.168.254 range with a subnet mask of 255.255.255.0. This is necessary to ensure that your computer can communicate with your TBATC-2000.

Your computer must have an Ethernet card and TCP/IP installed. TCP/IP should already be installed on computer using Windows 98/2000/XP and later operating systems.

Note: Connect a computer to TBATC-2000 Ethernet port directly should be with crossover Ethernet cable, if both connect to hub/switch should be with straight-through Ethernet cable.

2.3.1 Installing the TCP/IP Protocol

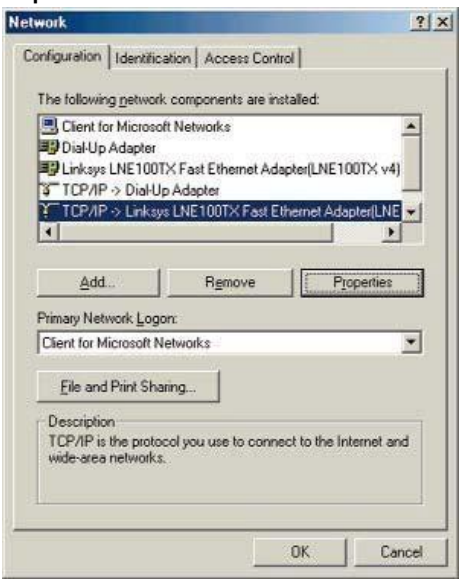
If you are not sure whether the TCP/IP Protocol has been installed, follow these steps to check, and if necessary, install TCP/IP onto your PCs.

Step 1: Click the **"Start"** button. Choose **"Settings"**, then **"Control Panel"**. Double-click the **"Network Connections"** icon. Your Network window should appear as follows:

Step 2:

For **Windows 98 and Millennium**

On the **"Configuration"** tab (**if using Windows 98 and Millennium PCs)**, select the **TCP/IP** line for the applicable Ethernet adapter. Do not choose a TCP/IP entry whose name mentions
PPPoE, VPN. If the word **TCP/IP** appears by itself, select that line. Click the **Properties** button.



Important:

For Windows 2000 & Windows XP Setting, you will find that they differ with Windows 98/ME/NT slightly. See the following for reference.

For **Windows XP and Windows 2000**

Click the **"Local Area Connection"** icon on the lower right hand side of your desktop screen.

In the **"Local Area Connection Status"** window, click the **"Properties"** button then your Network window will appear.

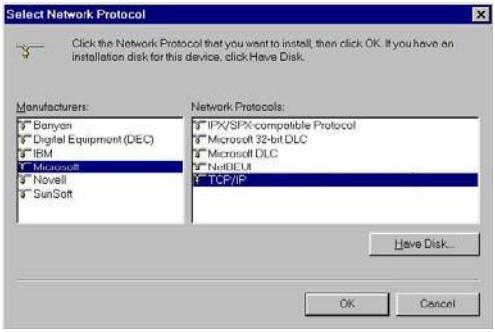
There are two tabs, **"General" "Support",** in the Network window.

Step 3: Check whether the TCP/IP Protocol has already been installed onto your computer's Ethernet card. Note that TCP/IP Protocol can be installed for a computer's Dial-Up Adapter as well as for the Ethernet card.

- If yes, go to section 2.3.2.
- If no, click the **"Install"** button.

Step 4: Double-click **"Protocol"** in the Select Network Component Type or highlight **"Protocol"** then click **"Add"**.

Step 5: Highlight **"Microsoft"** under the list of manufacturers. Double-click **"TCP/IP"** from the list on the right or highlight **"TCP/IP"** then click **"OK"** to install TCP/IP.



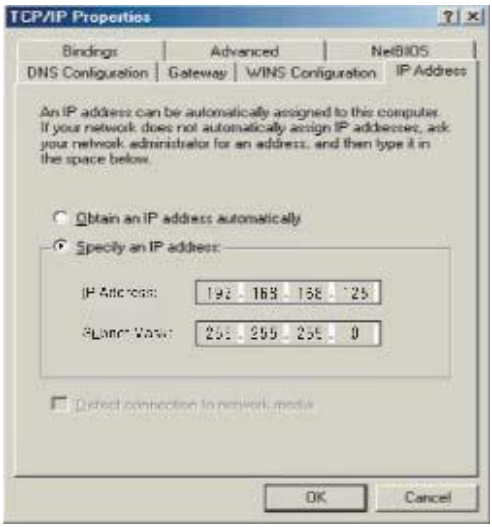
Step 6: After a few seconds, you will be returned to the Network window. The TCP/IP Protocol should now be on the list of installed network components (see 3 above).

2.3.2 Fixed IP Addresses Configuration

For **Windows 98 and Millennium**

Step 1: To set up computers with fixed IP Addresses, click the "**Properties**" button. The TCP/IP Properties window consists of several tabs. Choose the **"IP Address"** tab as shown below.

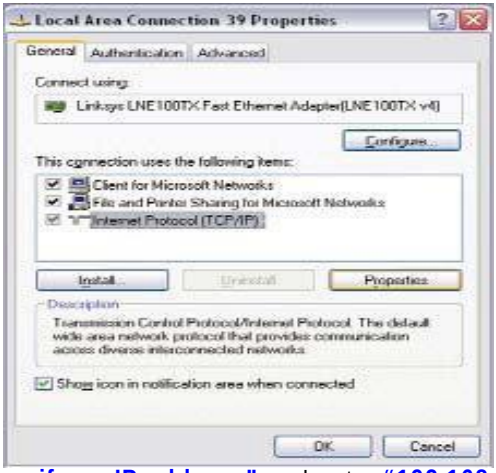
Step 2: Select **"Specify an IP address"** and enter **"192.168.168.xxx"** (the default value of TBATC-2000 is 192.168.168.125) in the **"IP Address"** location (where xxx is a number between 1 and 254 used by the High-Performance TBATC-2000 to identify each computer), and the default **"Subnet Mask" "255.255.255.0"**. Note that no two computers on the same LAN can have the same IP address.


TCP/IP Properties
Bindings
Advanced
NetBIOS
DNS Configuration
Gateway
WINS Configuration
IP Address
An IP address can be automatically assigned to this computer. If your network does not automatically assign IP addresses, ask your network administrator for an address, and then type it in the space below.
Obtain an IP address automatically
Specify an IP address:
IP Address:
Subnet Mask:
OK
Cancel

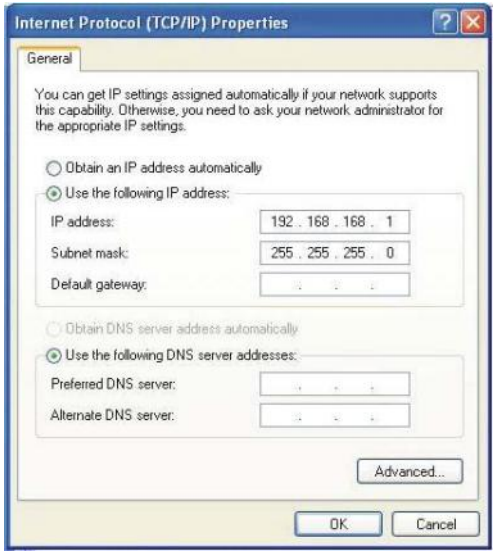
For **Windows XP and Windows 2000**

Step 1: Make sure the box next to Internet Protocol (TCP/IP) is checked. Highlight

Internet Protocol (TCP/IP), and click the **Properties** button



Step 2: Select **"Specify an IP address"** and enter **"192.168.168.xxx"** (the default value of TBATC-2000 is 192.168.168.125) in the **"IP Address"** location (where xxx is a number between 1 and 254 used by the High-Performance TBATC-2000 to identify each computer), and the default **"Subnet Mask" "255.255.255.0"**. Note that no two computers on the same LAN can have the same IP address.


Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
192 . 168 . 168 . 1
Subnet mask:
255 . 255 . 255 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

Click **"OK"**. to complete the TCP/IP installation.

2.3.3 Configure your TBATC-2000

Step 1: Open your web browser and type **http://192.168.168.125** in the browser's *address box*. This address is the factory set IP Address of your TBATC-2000. Press "**Enter**".

Step 2: The **"Username and Password required"** prompt box will appear. Typing "**admin**" (default username) in the Username field and typing **"admin"** (default password) in the Password field. Click "**OK**". The setup screen will then appear.

Step 3: It is highly recommended you change the default username and password when you login successfully first time.

Step 4: Setup the Operation Mode for TCP/IP connection and Serial Type for

connecting with your device.

Note: Don't forget click Apply button to save your changing when you complete your configuration setting each time, the TBATC-2000 will restart automatically in 10 seconds with your new setting.

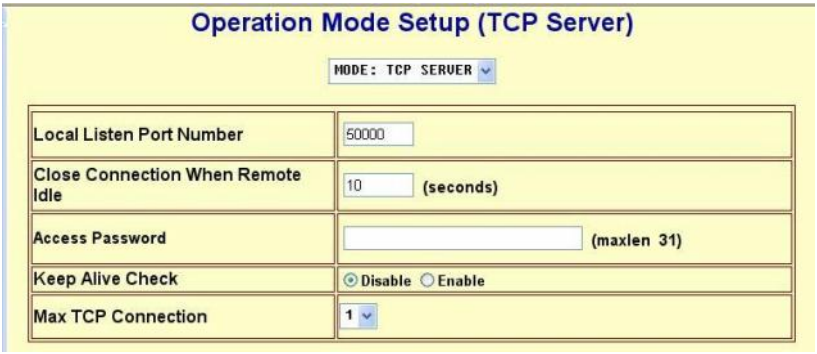
3. TBATC-2000 Configuration Setup

This chapter will show you how to configure TBATC-2000 to function in your network and gain access to your device through Intranet or Internet.

3.1 Operation mode

The TBATC-2000 support four operation mode: TCP Server, TCP Client, UDP Server and UDP Client. These modes are listed in the drop-down menu for the Operation Mode setting. Each setup screen and available features will differ depending on what kind of operation mode you select. Default is TCP Server.

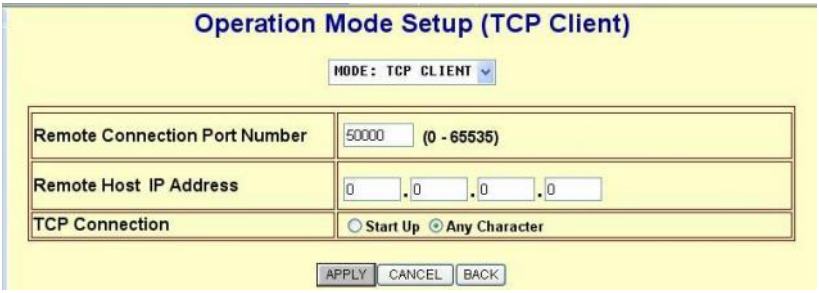
TCP Server



Listen Port Number: default **50000**, range **0** to **65535**
If your device is acted as passive to accept commands from remote and the data be guaranteed to be received by peer is your concern, then you can set TBATC-2000 as TCP Server. Be sure the value of item **Listen Port Number** is same as your remote control application using.

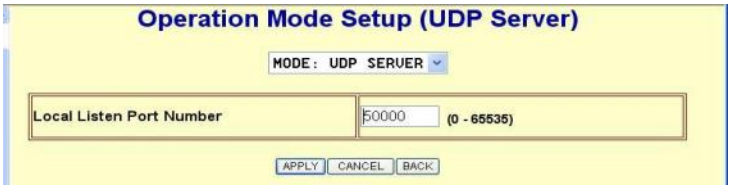
Close Connection When Remote Idle (second): default **300**, range **0** to **32768**
If you want to keep the connection between TBATC-2000 and your remote control application always on, then set the value of item **Close Connection When**
Remote Idle to 0, otherwise, when the idle time of no any traffic on line reach the setting value, TBATC-2000 will terminate this connection.

TCP Client



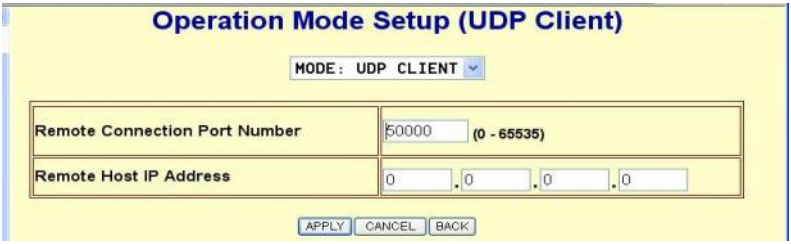
Remote Connection Port Number: default **50000**, range **0** to **65535**
Remote Host IP Address: default **0.0.0.0**
If your device is acted as active to report real-time status to remote and the data be guaranteed to be received by peer is your concern, then you can set TBATC-2000 as TCP Client. Be sure the value of item **Remote Connection Port Number** is same as your remote control application using and set the correct value of **Remote Host IP Address**.

UDP Server



Listen Port Number: default **50000**, range **0** to **65535**
If your device is acted as passive to accept commands from remote and the data be guaranteed to be received by peer is *not* your concern, then you can set TBATC-2000 as UDP Server. Be sure the value of item **Listen Port Number** is same as your remote control application using.

UDP Client



Remote Connection Port Number: default **50000**, range **0** to **65535**
Remote Host IP Address: default **0.0.0.0**
If your device is acted as active to report real-time status to remote and the data be guaranteed to be received by peer is *not* your concern, then you can set TBATC-2000 as TCP Client. Be sure the value of item **Remote Connection Port Number** is same as your remote control application using and set the correct value of **Remote Host IP Address**.

3.2 IP Configuration

The TBATC-2000 support three IP connection types: Static IP, DHCP and PPPoE. These types are listed in the drop-down menu for the IP Configuration setting. Each setup screen and available features will differ depending on what kind of IP connection types you select. Default is Static IP

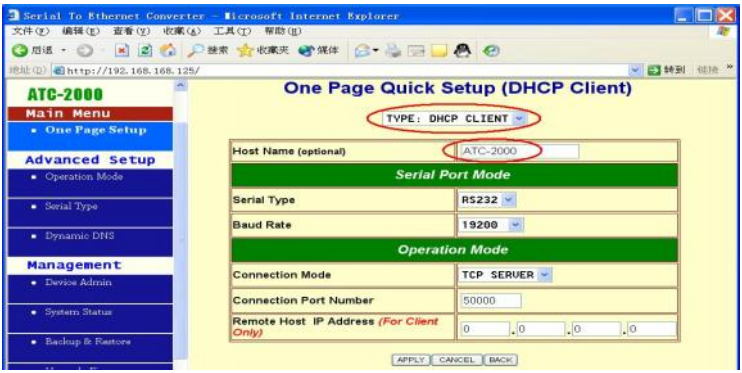
Static (or Fixed) IP

IP Address: default **192.168.168.125**
Subnet mask: default **255.255.255.0**
Gateway: default **192.168.168.254**
Primary DNS: default **168.95.1.1**

If you are connecting through a static or fixed IP from your network environment, perform these steps:
Step 1: Enter IP address
Step 2: Enter Subnet mask
Step 3: Enter Gateway IP address

Step 4: Enter Primary DNS IP address
Step 5: click Apply button

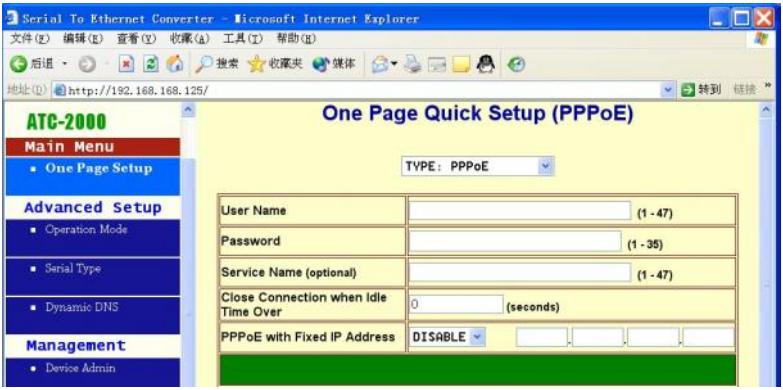
DHCP



Host Name (Optional): default **TBATC**, maximum length **15** characters
If there is a DHCP Server existing in your network environment or you subscribe a CABLE service from your ISP, you can set IP configuration to DHCP to get a dynamic IP address. The **Host Name** is an *optional* item, depending on your DHCP Server setting.

Note 1: to gain CABLE service, you also need to change the MAC address of TBATC-2000 to the MAC address of register in ISP. Please refer to Chapter 4 Device Admin/Mac Address Change

PPPoE



User Name: no default, maximum length **47** characters
Password: no default, maximum length **35** characters

Service Name (optional): no default, maximum length **47** characters
Close Connection when Idle Time Over (second): default **0**, range **0** to **4294967295**
PPPoE with Fixed IP Address: default **DISABLE**
If you subscribe a DSL service with PPPoE connection from ISP, you can set IP configuration to PPPoE to get a dynamic IP address. Your ISP will provide you the **User Name** and **Password**, some ISP will also need the **Service Name** to authenticate. But this item is optional and depending on your ISP.

If you want to keep the connection always on between TBATC-2000 and your ISP, then set the value of item **Close Connection When Idle Time Over** to 0, otherwise, when the idle time of no any traffic on line is over the setting value, TBATC-2000 will terminate this PPPoE connection.
If your ISP can provide you fixed IP address when PPPoE connection established each time, you can select **PPPoE with Fixed IP Address** as ENABLE and enter the IP address given from ISP.

3.3 Serial Type

The TBATC-2000 support three serial types: RS232, RS422 and RS485, These types are listed in the drop-down menu for the Serial Type setting. Each setup screen and available features will differ depending on what kind of Serial Types you select and TBATC-2000 product model you buy. Default is RS232

RS232

Baud Rate: default **115200**, range 1200bps to 230.4Kbps
Data Bits: 5, 6, 7, **8** (default)
Parity Check: **None** (default), even, odd
Stop Bits: **1** (default), 2
Flow Control: **None** (default), CTS/RTS (or Hardware), XON/XOFF (or Software)

Force Packet Transmit Time (ms): default **40**, range **20** to **65535**
The timing of transmitting an Ethernet packet, in order to get the whole data in on packet, you can tune this setting value to fit the data length of your device per transmission. The more small value be set will get more less data in one packet.

RS422

The settings are similar with RS232.

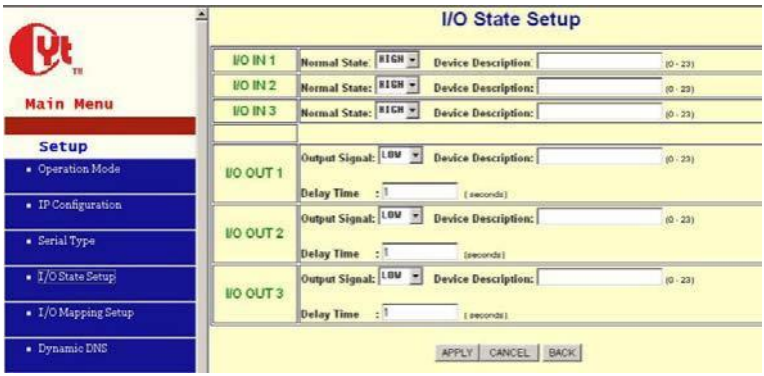
RS485

RS485 Transmission Delay Time (ms): default **0**, range **0** to **65535**
Due to different device has different capability in handling data received from serial port. So you can tune this setting value to slow down the speed of TBATC-2000 to fit the speed of your device handling.

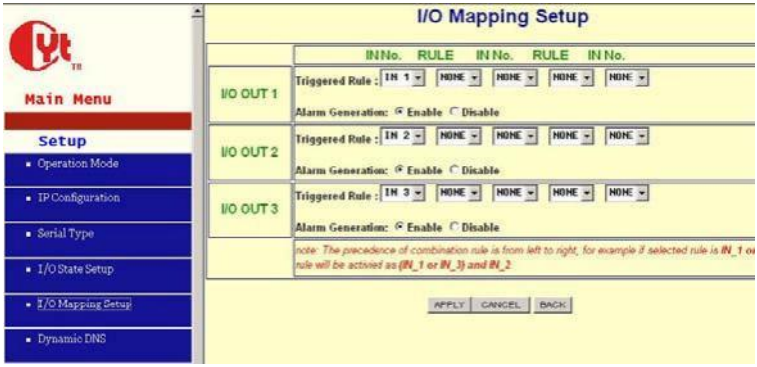
3.4 I/O State Setup

The TBATC-2000 support 6 digital I/Os, including 3 output and 3 input with fixed setting. The **Normal State** should be configured in advance to specify the state changing between normal and abnormal when connecting with your device. The **Device Description** is for administrator to naming the device for management purpose.

The **Output Signal** is defined to the signal state output by TBATC-2000 to inform or trigger another device. In the meantime, you can configure the **Delay Time** to last the signal for a period time. As to the trigger conditions (rules) are defined in next section.



3.5 I/O Mapping Setup


Main Menu
Setup
Operation Mode
IP Configuration
Serial Type
I/O State Setup
I/O Mapping Setup
Dynamic DNS
I/O Mapping Setup
IN No. RULE IN No. RULE IN No.
I/O OUT 1
Triggered Rule : IN 1 NONE NONE NONE NONE
Alarm Generation: Enable Disable
I/O OUT 2
Triggered Rule : IN 2 NONE NONE NONE NONE
Alarm Generation: Enable Disable
I/O OUT 3
Triggered Rule : IN 3 NONE NONE NONE NONE
Alarm Generation: Enable Disable
APPLY CANCEL BACK

The TBATC-2000 offers a very smart and easy method to operate I/O function. You do not need to equip any programming background. All you need to do is just making the relationship rules with each I/O. For example, if two devices (dev1, dev2) connected to **IN1** and **IN2**, another device (dev3) connected to **OUT1**, the trigger condition is the status change happened in both dev1 and dev2, in this case, you can select the **OUT1**'s rule as **IN1** AND **IN2**. By using TBATC-2000's logical rule to combine all condition you want.

Note: the priority of logical combination rule is from left to right, suppose the rule you select is IN1 or IN3 and IN2, the TBATC-2000 will treat this rule as (IN1 or IN3) and IN2.

The **Alarm Generation** allows you to set enable or disable alarm generation function (detail see the Chapter 4 Management/E-mail Alert).

3.6 Dynamic DNS

The TBATC-2000 offers a Dynamic Domain Name System (DDNS) feature. DDNS lets you assign a fixed host and domain name to a dynamic Internet IP address. It is useful when you want to access your device through Internet without static IP address. Before you can use this feature, you need to sign up for DDNS service at *www.dyndns.org* or *www.tzo.com* , two DDNS service provider. This service default is disabled.

If your DDNS service is provided by DynDNS.org, then select **DynDNS** in the drop-down menu. If your DDNS service is provided by TZO, then select **TZO**. The features available on the DDNS screen will vary, depending on which DDNS service provider you use. (Detail sees Appendix B)

Dyndns.org

User Name: no default, maximum length **31** characters
Password: no default, maximum length **31** characters
Device DNS Name: no default, maximum **47** characters

Enter the **User Name, Password, and Device DNS Name** of the account you set up with DynDNS.org.

Registry IP Address. The TBATC-2000's current Internet IP Address is displayed here. Because it is dynamic, it will change.

Status. The status of the DDNS service connection is displayed here.

Tzo.com

Email Address: no default, maximum length **47** characters
Password key: no default, maximum length **31** characters
Device DNS Name: no default, maximum **47** characters

Enter the **Email Address, Password Key,** and **Device DNS Name** of the service you set up with TZO.

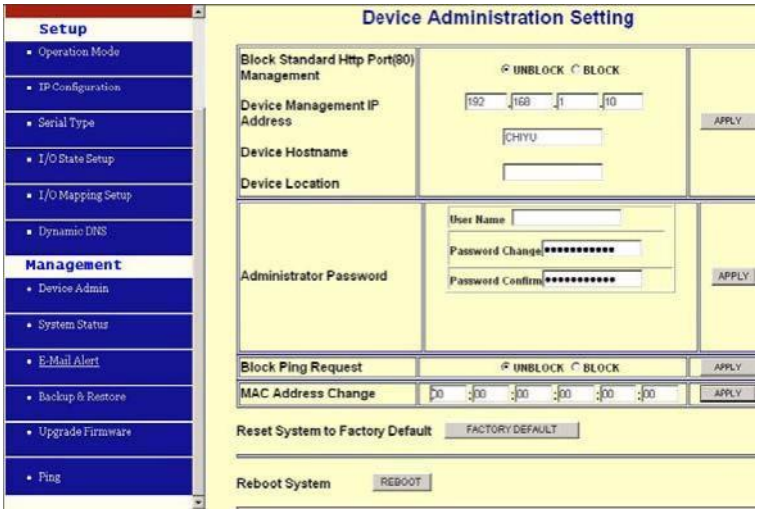
Registry IP Address. The TBATC-2000's current Internet IP Address is

displayed here. Because it is dynamic, this will change.
Status. The status of the DDNS service connection is displayed here.

4. TBATC-2000 Management Setup

This chapter will show you how to manage TBATC-2000's access setting as well as configure E-mail alert and firmware upgrade.

4.1 Device Admin



Block Standard HTTP Port(80) Management: default **UNBLOCK**
If for some reason, the HTTP (80) service is blocked in your network environment and result to fail to configure or manage TBATC-2000, then you select **BLOCK** this function with using port **8080**, instead of standard port 80. So you should enter: http://192.168.168.125:8080 in your browser.

Device Management IP Address: default **192.168.1.10**
In case, you forgot the TBATC-2000's IP address you ever set, this management IP can be used to connect to TBATC-2000 to figure out what's the current IP address be used.

In case, you set TBATC-2000's IP Configuration as DHCP or PPPoE which will assign dynamic IP address to TBATC-2000, you also can use this management IP address to find what's the current working IP address in Intranet.

Note: If you forgot the IP address setting even management IP address,

please use the broadcast utility we offer in CD to search it.

Device Hostname: default **TBATC**, maximum length **15** characters
To describe the name of TBATC-2000 for manage purpose.
Device Location: no default, maximum length **15** characters
To describe the location of TBATC-2000 for manage
purpose. **Administrator Password**
User Name: default **admin**
Password: default **admin**
To ensure the TBATC-2000's security, you will be asked for your password when you access the
TBATC-2000's Web-based Utility.

User Name: Enter the user name to one of your choice.

Password: It is recommended that you change the default password to one of your choice.

Password Confirm: Re-enter theTBATC-2000's new Password to confirm it.

Block Ping Request: default **UNBOCK**

To prevent hacker intruding your network, check the **BLOCK** option to enable this function to reject the PING requests from Internet.

MAC Address Change

The TBATC-2000's MAC address can be changed from the original values if necessary. Some ISPs require users to change the MAC address to a registered one when users change their access equipment. (Detail sees Appendix B)

Reset System to Factory Default

Click **"Apply",** if you want to return all the TBATC-2000's current settings to its factory default. *Note: do not restore the factory defaults unless it is absolutely necessary***.**

Reboot System

Click **"Apply",** if you want to clear a connection, reboot, and re-initialize the unit without affecting any of your configuration setting.

4.2 Device Status

This screen shows the TBATC-2000's current status. All of the information provided is read-only**.**

Product Name: the product model name of this TBATC-2000.
Firmware Version: the installed version of the firmware.
System up Time: the time of system from start up to current.
Management IP Address: the current setting of management IP.

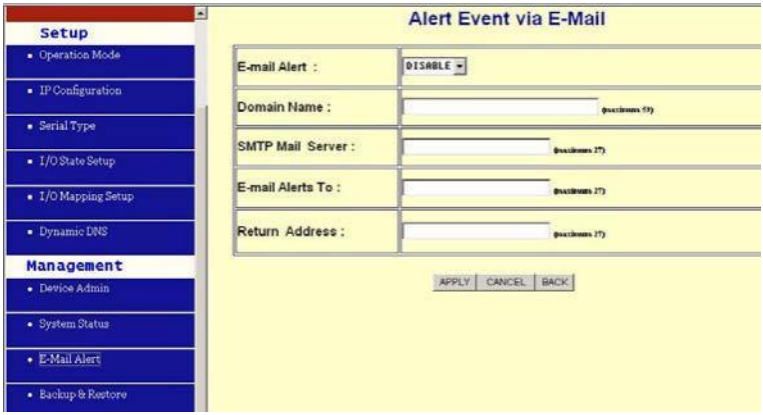
Ethernet Status: the TBATC-2000's IP Configuration, MAC address, IP address, subnet mask, default gateway IP address, primary DNS IP address and current connection status.

Serial Status: the TBATC-2000's setting in serial type

Statistic: the transmission and receive bytes and packets count in Ethernet and Serial port separately.

4.3 E-Mail Alert

The TBATC-2000 allows you send E-Mail to alert the event of I/O state changing. This service default is disabled.



E-mail Alert: default **DISABLE**
Domain Name (optional): no default, maximum length **59** characters
SMTP Mail Server: no default, maximum length **27** characters
E-mail Alerts To: no default, maximum length **27** characters
Return Address: no default, maximum length **27** characters

Select ENABLE in **E-mail Alert**
Enter the **Domain Name** in this field if needed. **(this is optional)**
Enter the **SMTP Mail Server** in the field.
Enter the e-mail account you want to reach or notice in the field of **E-mail Alerts To**.
Enter the e-mail account you want to return in the field of **Return Address**.

4.4 Backup and Restore

This function allows you to save TBATC-2000's configuration as backup, or retrieve the configuration file you saved before to turn the setting back.

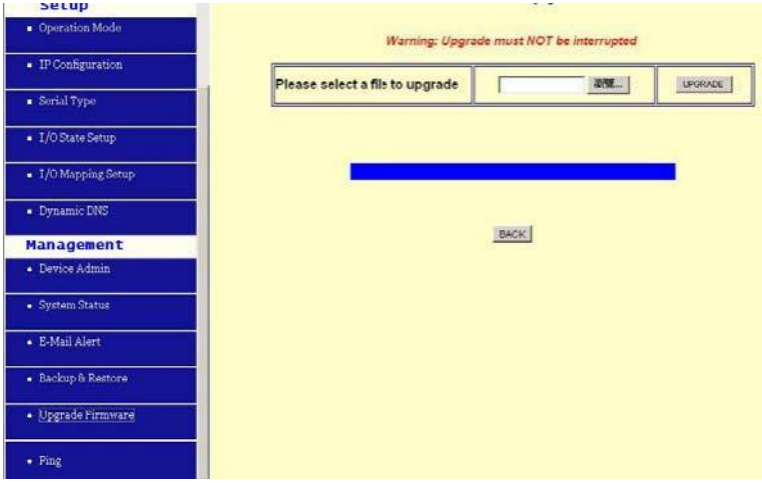
Backup: Click "Backup" button save the current configuration as a backup file in your hard disk.

Restore: Enter path of the configuration file you saved on the PC. You can click "Browse" to view the folders and select the file. Click "Restore" to retrieve it.

Note: the sub-name of file you retrieve must be ".cfg"

4.5 Upgrade Firmware

This function allows you to upgrade the latest version firmware to keep your TBATC-2000 up-to-date. Before you upgrade the firmware, you have to get the latest firmware and save it on the PC you use to configure the TBATC-2000.



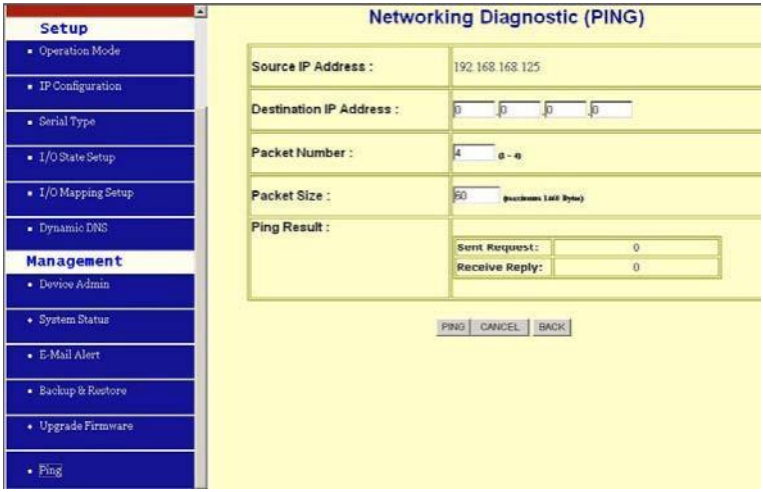
Browse: To select a file to upgrade, you have to enter path of the latest firmware you saved on the PC. You can choose "**Browse**" to view the folders and select the firmware.

Upgrade: After you enter or select the path, click "**Upgrade**" to start the firmware upgrade process.

Note: don't power off the router during the firmware upgrading, otherwise the incompletion of firmware upgrading will cause serious damage to the integrity of the TBATC-2000's firmware that will lead to fail to boot the TBATC-2000 again.

4.6 Ping

This function allows you to test the connection between TBATC-2000 and LAN or between TBATC-2000 and Internet.



Source IP Address: the current TBATC-2000's IP address (Read Only).
Destination IP Address: the IP Address of destination device you want to ping.
Packet Number: the packet numbers you wish to use to ping the destination device. The maximum numbers are **4**.
Packet Size: the numbers of packet size you wish to use to ping the destination device. The maximum packet sizes are **1400**.
Ping Result: The result will show the numbers of sending packet, numbers of packet receiving (Read Only).

5. Troubleshooting

PROBLEM	CORRECTIVE ACTION
None of the LEDs turn on when you turn on the TBATC-2000	Make sure that you have correct power connected to TBATC-2000 and plugged in to an appropriate power source. Check all cables connections. If the LEDs still do not turn on, you may have a hardware problem. In this case, you should contact your local vendor.
Can not access TBATC-2000 from Ethernet	Check cable connection between TBATC-2000 and computer or hub. Ping TBATC-2000 from computer. Make sure your computer Ethernet card is installed and functioning properly.
Can not ping any computer on the LAN	If the 10/100M LED are off, check the cable connection between TBATC-2000 and your computer. Verify that the IP address and subnet mask of the TBATC-2000 and computer are in the same IP address range.
Can not access TBATC-2000 from Serial	Check the Serial cable connection between TBATC-2000 and your device. Verify that the TBATC-2000 setting of Serial type is same as your device and make sure the hardware jumper is